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EXAMINER

HANDY, DWAYNE K

ART UNIT

PAPER NUMBER

1743

DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/824,330

Applicant(s)
Nelson et al.

Examiner
Dwayne K. Handy

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1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2-6 20) ☐ Other:

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1, 8, 10 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Moore et al. (6,224,832). Moore et al. teach a synthesizer and method for combinatorial chemistry. The device is best shown in Figures 1-3 and includes a number of flow through reactor cells with each cell having a different compound for reacting with fluid flowed through the cells. The cells are connectable to, and disconnectable from, one another so that reagent flow paths can be established through different subsets of reactor cells connected in series. The method of using the device is recited in claim 1 and includes providing the reactors in a flow through set up and flowing reagents through the reactors. The Examiner considers the rearrangement of the flow

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path or reactions cells to be a stepwise adjustment which changes the components of the reaction cell.

3. Claims 1-4 and 8-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Freitag et al. (6,566,461). Freitag et al. (6,566,461) teach a method for continuous or semicontinuous parallel reactions. The basic methods of the invention are recited in the claims and include providing a continuous reactor with a plurality of continuous vessels, initiating a reaction in each vessel and feeding one or more components into each of the plurality of vessels. The basic embodiment of the reactor system is shown in Figures 1-3 and described in columns 2-3. Mixing reactors are taught in column 3, lines 52-60. Freitag teaches controlling methods and devices in columns 17 and 18 and includes the use of temperature and chemical conversion as variables which may be used to effect or control the reactions in the vessels. Reaction control by mixing is recited in column 14, lines 35-53. Freitag discloses a wide variety of reaction types which may be conducted using their method in column 19, lines 40-63 - including coordination reactions.

4. Claims 1-3, 8-10 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Flanagan et al. (2003/0055295). Flanagan et al. teach a method for producing multiple chemical reactions and then screening the results. The method includes the steps of providing an array of reactor vessels and reactants, loading each reaction vessel with at least one reactant and allowing the reactions to proceed for a predetermined time interval. As shown on page 2, the reactions

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may be continuous flow [0016] and are controlled through the stepwise addition and removal of a volume of material from the reactor. Flanagan recites the types of reactions which may be performed with their method on page 3 and includes a wide variety of polymeric reactions.

5. Claims 1, 2, and 8-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Bergh et al. (2002/0170976). Bergh et al. teach a parallel flow reactor and methods of using the reactor in combinatorial chemistry. The methods of using the reactor are recited in the claims and include providing the reactors, adding reactants to the reactors, and the use of temperature profiles in controlling the reactor. The reactor is best shown in Figure 2A and plug flow design is cited on page 6 [0032]. The evaluation of reaction products is described on page 7 [0038].

Inventorship

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freitag et al. (6,566,461) in view of Citron et al. (2002/0026016). Freitag, as described in paragraph 3 above, teaches every element of the method of claim 14 except for the use of a metallocene catalyst. Citron et al. teach a process for the production of polyolefin copolymers in a plug flow reactor. As stated by Citron on page 6 [100, 101, 102], the preferred catalyst for the process of Citron

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uses a metallocene catalyst. It would have been obvious to one of ordinary skill in the art to combine the use of the metallocene catalyst from Citron with the method of Freitag. Freitag already teaches coordination reactions, but does not cite the use of a metallocene catalyst. One would add the metallocene catalyst to perform copolymerizations as described by Citron.

10. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freitag et al. (6,566,461) in view of Priddy et al. (4,572,819). Freitag, as described in paragraph 3 above, teaches every element of the method of claims 5 and 7 except for the use of an extruder in the reaction. Priddy et al. teach an apparatus for anionic polymerization wherein the molecular weight of the polymer is closely controlled. In Example 2, Priddy discloses the use of an extruder in making their polymer. The extruder is used to remove the polymer from the reactor in strand form so that the polymer may be examined or used. It would have been obvious to one of ordinary skill in the art to combine the use of an extruder with the method of Freitag. Extruders are commonly used to remove solid materials during the formation of polymers from liquid precursors. It would be advantageous to use an extruder for removal of products in a continuous system for examining reaction products.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freitag et al. (6,566,461) in view of Austin et al. (2002/0099137). Freitag, as described in paragraph 3 above, teaches every element of the method of claim 6 except for the use of a static mixer in mixing the

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reactants. Austin et al. teach a continuous process for the manufacture of a silicone copolymer. The process is enhanced through the use of a static mixing element which creates eddies and vortices of sufficient intensity that a biphasic liquid mixture of reactants is formed and one phase disperses into another to provide intimate contact between the two phases to allow the reaction to proceed. One would add the static mixer of Austin to take advantage of these mixing properties. This feature would be desirable in a polymerization reaction system.

Conclusion


12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Turner et al. (6,306,658; 6,508,984), Wang et al. (6,489,168), and Carnahan (2003/0012700) teach systems and methods for combinatorial reactions. Yadav et al. (6,531,704) teach a microfluidic system for performing combinatorial reactions.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwayne K. Handy whose telephone number is (703)-305-0211. The examiner can normally be reached on Monday-Friday from 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden, can be reached on (703)-308-4037. The fax phone number for the organization where this application or proceeding is assigned is (703)-772-9310.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0661.


Jill Warden
Supervisory Patent Examiner
Technology Center 1700

dkh

June 28, 2003